

and then to make the slightest and most trivial character serve as a basis for a new species, even when it is known that the character is elsewhere in the genus a known variable one.

In my *Satyris* paper I termed "forms" what I here term "races." The latter is more expressive and more in accordance with the nomenclature in other departments of zoology.

CONTRIBUTIONS TO THE NORTH TRANS-CONTINENTAL SURVEY.

BY LAWRENCE BRUNER, WEST POINT, NEBRASKA.

ORTHOPTERA.

Herewith is presented for publication a partial list of the Orthoptera collected by Dr. H. A. Hagen and Samuel Henshaw during the summer of 1882, along the line of the Northern Pacific Railway. The collection, although not an extensive one, contains some new forms, as well as several interesting varieties of well known species. The collection is also of much interest in extending the range of quite a number of species heretofore recorded as occurring only on the eastern slope of the continental divide, or at the extreme eastern edge of the great interior basin, to the western slope.

Taken as a whole, this collection of Orthoptera is very complete for the regions in which it was made, and shows careful work both in its formation and preservation. It is to be regretted, however, that so few specimens of some of the more interesting forms were taken, a feature which, no doubt, might have been remedied to some extent had their value been known at the proper time.

There still remain a few species which are to be more carefully studied and compared before they can be properly placed. These, when I have the time to do so, will be worked up, and, in connection with the doubtful ones here enumerated, will form the subject for a future paper, when, it is hoped, I will be able to add such points as have been carelessly overlooked here.

ACRIDIDÆ.

Stenobothrus æqualis Scudd. Quite a large series of what appears to be this insect were taken July 16, at Yakima River. The specimens differ from eastern ones in several respects, but not enough to warrant describing them as new. The occiput is a trifle longer than usual, and the middle row of spots on the tegmina extends almost to the tip. There are males and females of both greenish and brownish-gray colors.

Stenobothrus coloradus Thos. A few examples of the ordinary form on Yakima River, July 16.

Stenobothrus curtipennis Scudd. This trim little species is represented by quite a large number of specimens, among which at least three well marked varieties occur. They were taken at various points along the Yakima River in July.

Stenobothrus sp.? A single specimen of a species resembling *S. brunneus*. and perhaps that species, but so badly damaged that it is difficult to place it with a certainty. Same locality as the preceding.

Chlocaltis abdominalis? Thos. The collection contains a single male which is doubtfully referred to this species. Locality not noted.

Aulocara elliottii Thos. This species was numerous at Yakima and Ellensburg, as well as at many other points in eastern W. T. Among the specimens examined I find two well marked varieties which agree with Mr. Scudder's description of *A. cæruleipes* sufficiently close to be referred to that species, which is a synonym of *Stauronotus elliottii* Thos.

Dissosteira carolina Linn. Three specimens of this wide-spread species were taken at Portland, Oregon.

Circotettix undulatus Thos. A few at Yakima, July 16.

Circotettix carlingianus Thos. Same locality as the preceding.

Trimerotropis suffusa Scudd. A few specimens from some point in Washington Ter. which I neglected to note when they were examined.

Trimerotropis vinculata Scudd. W. T.

Trimerotropis pseudofasciata Scudd. A single male from some point in eastern W. T. This species was found by me on Birch Cr. in central Idaho, where it was quite common during July and August, 1883.

Trimerotropis cæruleipennis, n. sp.

Distinct from all other North American species with which I am acquainted in the coloring of the wings.

Wings without the median dusky band, faint cærulean blue at the

base. Tegmina with the dusky markings not forming definite bands as a rule.

Vertex between the eyes rather broad, bounded by a sharp wall, with a well defined carina running longitudinally through the middle; frontal costa moderately prominent, contracted a little at its upper end and at the ocellus, widening below; sulcate throughout, deepest at the ocellus, the bounding walls or carinae sharp, reaching the clypeus. Antennae normal. Pronotum with the anterior lobes a trifle more contracted above than usual, the median carina distinct throughout, considerably elevated on the anterior lobes where the disk is much swelled and tuberculate. Tegmina rather narrow, extending beyond the abdomen one third their length. Posterior femora reaching the tip of the abdomen.

The general color is a dirty grayish yellow or yellowish brown, profusely flecked with irregular brownish dots. Face and sides of pronotum, with the anterior and middle legs, dirty whitish gray, densely flecked with various shades of brown; there are a few black dots and dashes along the carinae of the face, pronotum and posterior femora. Antennae annulated with alternate rings of testaceous and obscure brown. Tegmina cinereous brown on the basal two-thirds, transparent on the apical third, flecked with numerous small, quadrate, obscure brown spots, which, in some specimens, are pretty evenly distributed over the wing, while in others they are gathered into three irregular bands, the basal one occupying the basal third, the middle one the centre, and the other the apical third of the wing; beyond this the principal veins are brown, while there are also a few of the quadrate spots scattered at random. Wings beautiful sky-blue at base, gradually fading toward the middle, where the colored portion terminates. At this point and where the fuliginous band usually occurs, the nerves and nervures are dark, but otherwise there is no indication of a dusky band. Beyond this the wings are perfectly transparent, with nerves and nervures near the apex dusky. The upper portion of the thoracic and basal abdominal segments is tinged with a faint bluish color. Posterior femora with two dusky spots on the upper edge which are continued as black bands on the inner face, where the apex is also black; posterior tibiae glaucous, with the inner base black, followed below by a rather wide yellowish white annulus, spines black-tipped; tarsi bright yellowish white. Lower surface dirty whitish.

Length of body, ♂ 20 m.m., ♀ 28 m.m.; of antennae, ♂ 7.5 m.m.;

♀ 9.5 m.m.; of tegmina, ♂ 22 m.m., ♀ 31 m.m.; of hind femora, ♂ 10 m.m.; ♀ 15 m.m.

Specimens from Umatilla and Yakima, June 26-July 10. There are also specimens of this insect in the U. S. National Museum at Washington, from Montana, Idaho and Wyoming, and I have seen others that were taken in Utah.

Psinidia sulcifrons Scudd. A pair of what I take to be this species from a point in eastern W. T.

Psinidia wallula Scudd. Specimens taken July 18, at Lone Tree, Yakima River, and others at various localities in eastern Washington Terr.

Camnula pellucida Scudd. The collection contains quite a large series of this destructive locust, obtained at various points in Washington Territory during the month of July. Most of the specimens examined are of a rather darker color than usual in Pacific Coast representatives of this species.

Arphia tenebrosa Scudd. Quite a large series of specimens from La Chapples, on the Yakima River. These are of the variety described by Stal as *A. sanguinaria* in his Orthoptera Recentia.

Hippiscus montanus Thos. A few specimens taken at Camp Umatilla, W. T., June 27.

Hippiscus lineatus Scudd. Colville, W. T., July 24.

Hippiscus lineatus (?) Scudd. Var. The collection contains a few specimens of an insect agreeing with this species in all other respects, save the humeral vitta of the tegmina, which are wanting in these. The tegmina are also more equally flecked with small dusky spots than in typical specimens. Taken July 4-16 at various points along the Yakima River.

Hippiscus Haldemanni Scudd.? Several specimens doubtfully referred here, but do not know just where taken.

Hippiscus corallipes Hald. Several specimens which appear to belong here.

Pezotettix borckii Stal. The collection contains a single female which I refer to this species, from a point in eastern W. T.

Pezotettix hispidus, n. sp.

Without tegmina or wings. Body robust, glabrous, striped with yellow and piceous; posterior femora reaching beyond the extremity of the abdomen in both sexes. Hispid throughout.

Vertex between the eyes moderately broad, depressed, broadly and quite deeply sulcate, the sulcus broadening gently anteriorly where it is open, with a faint longitudinal carina through the centre; the lateral walls prominent, rather broadly and roundly angled, highest just above the upper canthus of the eyes; fastigium coarsely punctate. Frontal costa prominent, nearly equal, as broad as the front edge of the fastigial sulcus; deeply sulcate throughout. Lateral carinae diverging, reaching the lower corners of the face. Lateral ocelli very prominent, larger than the ocellus of the frontal costa, of a bright amber color. Antennae as long as the head and thorax combined, the basal joint large, as wide as long, second joint pyriform. Eyes of moderate size, rather prominent, nearly globular (male), or with the front edge almost straight (female). Pronotum equal in the male, expanding posteriorly in the female; median carina slight but visible throughout, most prominent in the female, lateral carinae obsolete; front margin straight, posterior margin slightly truncate, posterior lower angle nearly a right angle. Meso- and metanotum not differing on the dorsum from the basal abdominal segments. Abdomen tapering evenly and gradually posteriorly, sharply carinated; last segment in the female greatly contracted, valves of the ovipositor exerted, reminding one of the structure of these parts in *Tettigidea*; male abdomen with the last ventral segment pointed, the apex squarely docked and slightly but roundly notched. Supra-anal plate a little longer than broad, somewhat triangular, the posterior margin gently rounded, the apex slightly produced. Anal cerci cylindro-conical, directed upward and a very little backward, the extreme tip slightly contracted to a rather sharp point. Female cerci cuneiform, directed backward. Posterior femora moderately robust, but not greatly thickened at the base, with all the carinae prominent and sharp, extending beyond the abdomen in both sexes. Posterior tibiae normal; tarsi with the first and third joints equal.

General color brownish piceous above, yellowish beneath. Face, lower half of the deflected lobes of the pronotum, and under surface of the body, with the anterior and middle legs ochraceous (female) or citrinous (male). Antennae fuscous. A bright yellow line commencing on the lateral margins of the fastigial sulcus and extending backward on each side of the occiput across the pronotum at the outer edges of its disk to the tip of the abdomen, enclosing along the middle a line of the brownish piceous. Below these, on the sides, a broad stripe of the upper surface color, extending from the hind margin of the eyes to the tip of the abdo-

men, separating the dorsal yellow stripes from the yellowish under surface, enclosing on the meso- and metapleura a bright yellow patch and oblique line. Posterior femora with the disk and upper edge brownish yellow or yellowish fuscous, inner side with lower sulcus bright red; upper surface with very faint indications of the usual dark bands. Posterior tibiæ yellowish brown, becoming paler apically, a broad yellowish annulation near the base, spines black tipped.

Length of body, ♂ 18.5 m.m., ♀ 21 m.m.; of antennæ, ♂ 9.25 m.m., ♀ 10 m.m.; of pronotum, ♂ 3.35 m.m., ♀ 4 m.m.; of hind femora, ♂ 11 m.m., ♀ 11.5 m.m.

Colville, W. T., July 24.

This insect has been placed here provisionally, but will have to be removed to its proper place when the section of the family to which it belongs has been properly worked up in this country.

Pezotettix washingtonius, n. sp.

Yellowish white beneath, ferruginous above. Tegmina pointed, nearly two-fifths as long as the abdomen.

Head rather small, short; seen from the front somewhat quadrate. Vertex between the eyes a little wider (male), or once again as wide (female) as the first antennal joint, much depressed; deeply sulcate in the male, scarcely so in the female; sides nearly parallel, broadening slightly anteriorly; front margin not closed. Frontal costa rather prominent, nearly equal, contracted a trifle at the fastigium, edges rounded, not sulcate, rather coarsely punctured above the ocellus. Eyes large, rather prominent, rounded posteriorly, straight in front; equaling in length the portion of the cheeks below them. Face slightly arcuate, somewhat oblique. Pronotum with the sides nearly equal (male), or broadening slightly posteriorly (female); median carina distinct on the posterior lobe and the front margin of the anterior lobe in the male, and on the posterior lobe only in the female; lateral carinæ, or rather the lateral angles, middling sharp, nearly equal throughout, cut by the middle and last transverse incisions; disk punctulate; the three transverse sulci or incisions deep, the middle and last passing the lateral angles to the sides, posterior one about the middle. Sides of the pronotum somewhat gibbous, appearing as if composed of three well-defined lobes or segments when observed from above, most apparent in the male. Front margin nearly straight, very slightly truncate; posterior margin obtusely rounded. Meso- and meta-

thorax rather longer than usual, thereby throwing the base of the posterior femora about (female) or back of the middle of the body (male), and giving it a rather "long-waisted" appearance. Tegmina extending upon the second abdominal segment, ovate-lanceolate, meeting upon the dorsum. Abdomen carinated, rather slender; the last ventral segment of the male upturned, prow-shaped, with the point produced into a blunt projection; cerci rather long, the width about one third the length, directed a little backward and inward with the apex rounded and curving slightly forward; supra-anal plate triangular, the apex rounded and minutely notched, with a long, deep central foveola; marginal apophyses of the preceding segment small, wart-like projections. Posterior femora inflated at the base, rather smooth, extending beyond the apex of the abdomen. Prosternal spine large, conical, transverse, rather long, and directed backward. Antennæ normal, a trifle longer than the head and pronotum combined.

The general color is testaceo-ferruginous above, yellowish beneath. Face, occiput and disk of the pronotum flecked with numerous minute fuscous dots, which run together in some specimens and form rather large irregular blotches; a broad piceous band extending from the posterior edge of the eye along the upper margins of the lateral lobes of the pronotum to the last transverse incision. Meso- and meta-pleura dark brown or black with a stripe of the light color extending from the base of the tegmina to the insertion of the posterior femora. Tegmina dark brown with a few irregular, fuliginous dots along the middle area; nerves a little lighter. Posterior femora testaceous, with the base and two rather dim bands fuscous, these bands being plainest on the upper edge. There are also a few black dots along the lower edge of the disk and about the apex. Posterior tibiæ bright red, with the knee and spines black. Antennæ testaceous, becoming slightly infuscated apically.

Length of body, male 18.5 m.m., female 22 m.m.; of antennæ, male and female 8 m.m.; of tegmina, male 5.5 m.m., female 6 m.m.; of hind femora, male 10.5 m.m., female 12 m.m.

A large series at Loon Lake, Colville Valley, Washington Terr., July 25th.

Pezotettix enigma Scudd. Yakima River, July 16, and other localities in W. T.

Bradynotes opimus Scudd. Ten specimens of this clumsy, wingless locust were taken on Yakima River opposite Ellensburg. July 8, 9.

Bradynotes montanus, n. sp.

Small, comparatively slender, dark reddish brown, with livid yellow and white markings; tegmina sometimes obsolete, when present as in *Pezotettix gracilis*.

Vertex between the eyes very broad, slightly deflected, scarcely sulcate, with a very faint though perceptible transverse depressed line joining the upper extremities of the eyes, this line bending forward so as to form a gentle arc with the convexity to the front. Frontal costa moderate, nearly equal throughout, expanding a little at the ocellus, where it is very shallowly sulcate. Pronotum simple, expanding equally and rapidly posteriorly in the female, nearly equal in the male; front margin straight, posterior margin slightly but broadly truncate; median carina of the pronotum slight, visible throughout, on the anterior lobe as a mere smooth line not elevated in the least, in some specimens represented by a very faint depressed hair line, on the posterior lobe slightly elevated, the sides gently tapering; lateral carinae obsolete, except in some specimens where they are visible on the extreme front edge of the anterior lobe as blunt shoulders. Anterior lobe coarsely and somewhat distantly, and the posterior minutely and thickly punctate, rugulose. Abdomen carinate, tapering gently and evenly backward. Tegmina situated low on the sides, small, straight, narrow, three times as long as broad, the apex rounded. Posterior femora short, somewhat tumid, nearly (female), or just reaching the tip of the abdomen (male). Last ventral segment of the male abdomen upturned, prow-shaped, entire; cerci elongate conical, with the tips directed backward and gently downward, reaching a trifle beyond the tip of the supra-anal plate. This latter very similar to that of *B. obesus*, but proportionally broader apically. Female cerci mere rudiments, while in *B. obesus* and *B. opimus* they nearly equal those of the male.

The general color is dark reddish brown with livid yellow and white markings above, flavous beneath. Face griseous yellow, becoming darker above, the vertex and occiput brownish fuscous; a very narrow but sharply defined yellow line commencing near the upper posterior angle of the eye, separating the occiput from the genæ and extending backward on to the pronotum, where the lateral carinae would be if present; in some specimens a third line of a similar nature is present, beginning at the vertex and extending backward along the middle of the occiput. Sides of pronotum yellowish white, with a broad brownish piceous band extending from near the middle of the anterior lobe obliquely upward to the posterior

transverse incision; posterior lobe with the dorsal surface much lighter colored than the anterior lobe. Abdomen with a bright yellowish white line following the dorsal carina its entire length, this line bordered below by a black line followed by a medium broad band of the general color above; below this last band the sides of the abdomen are dull blackish or fuliginous. All these lateral lines and stripes fade away apically. Posterior femora brownish testaceous above, with the upper carinæ and inner and outer upper half of the apex black; there are very faint traces of the usual dusky bands present on the upper surface. Tibiæ yellow, spines black-tipped, tarsi yellowish with a lurid tinge.

In the living insect the colors are much brighter and contrast very strongly. The yellowish hair lines and dorsal line of the abdomen are glossy white, while the front and lower surface are of a bright lemon yellow. The brown is a bright hazel.

Length of body, male 17 m.m., female 22 m.m.; of pronotum, male 3.85 m.m., female 4 m.m.; of antennæ, male 6 m.m., female 6.75 m.m.; of tegmina (when present), male 2.25 m.m., female 2 m.m.; of hind femora, male 8.5 m.m., female 10 m.m.

Habitat.—Colville, Loon Lake, Washington Terr., July 23-25 (Dr. H. A. Hagen); also near Helena, Montana, among the trailing junipers on north mountain slopes at moderate elevations (L. Bruner). There were a few pairs in the present collection taken as cited above.

Melanoplus atlantis Riley. The collection contains quite a number of specimens that must be referred to this wide-spread and everywhere abundant species, although they vary considerably from typical specimens taken at the east. At various points in Washington Territory.

Melanoplus cinereus Scudd. Lone Tree, Yakima River, July 18.

Melanoplus infantilis Scudd. The collection contains a single female of this small species, which was taken at some point in eastern W. T.

Melanoplus curtus Scudd. A pair of short-winged Melanopli which are referred to this species without hesitation. This species is very closely related to *M. rectus*, an insect found in the mountains of New England.

Melanoplus femur-rubrum DeGeer. The collection contains but a single male specimen of this species, which comes near *M. interior* Scudd.

Melanoplus minor Scudd. There are two males of this well-marked species, which has, at various times, been referred to *Caloptenus occidentalis* Thomas, but which is quite distinct from that species. They were taken in eastern W. T.

Melanoplus Packardii Scudd. There are quite a number of this species in the collection, taken at Umatilla, Oreg., and also near Ellensburg. These specimens are interesting since they all have the hind tibiæ red instead of bluish, as in the typical specimens from Nebraska and neighboring States.

Melanoplus extremus Walker (?). The collection also contains a few specimens of a *Melanoplus* which is referred with some doubt to this species of Walker's. The insect in question is somewhat closely related to *M. atlantis* Riley, but differs from this species in its larger size, more robust form, comparatively shorter tegmina and wings, the much longer and more upturned last ventral segment of the male abdomen, and in the longer and broader cerci of the male. The general color is a dirty yellowish with markings of dull brown and black, arranged much as in *M. atlantis*. The female can be distinguished from that of *atlantis* in its more robust form and the much heavier and more rounded prosternal spine. Hind tibiæ dull yellow, with a very faint brownish tinge in some specimens.

There are also specimens of this insect in the collection of the U. S. National Museum from Ft. McLeod, British America, and Helena, Ft. Ellis and the Madison Valley, Montana, and also Salmon City, Idaho.

Melanoplus femoratus Burm. A few specimens from W. T.

Melanoplus ——— sp. The collection also contains a few specimens of what appears to be still another species somewhat closely related to *M. atlantis* and *M. scriptus* Walk., but which were not critically examined when the specimens were before me. These were also taken in W. T.

There are also quite a large number of specimens of the genus *Tettix* which I have not tried to determine, of which there are at least two species. I expect, however, to work up this section of the Acrididæ after I have more material at my command than at present.

GRYLLIDÆ.

Gryllus luctuosus Serv. ? The specimens in the collection which are referred to this species with some hesitation, are all females, and have the ovipositor very long, 16 m.m. Taken at Spokane, W. T., and Umatilla, Oreg.

Gryllus neglectus Scudd. There are five females of another species which are referred here. They have the ovipositor 10 m.m. in length. Portland, Oreg.

Gryllus —— sp. Still another species of *Gryllus* is represented in the collection by two females and one male. These are somewhat larger than the preceding species and have the ovipositor 12.5 m.m. in length. One female taken at Portland, Oregon, June 19, a second at Camp Umatilla, June 27, and the third, a male, at Yakima River, July 18.

Gryllus —— sp. The collection contains a single specimen of a fourth species, a female also. It has the posterior femora quite long and robust, reddish brown, and ovipositor of the same color, length of latter 13.75 m.m. Camp Umatilla, June 27.

Æcanthus —— sp. I find in this collection some pupæ of an *Æcanthus*, probably *Æ. niveus*. Locality not noted.

There are also specimens of the following genera of Locustidæ that have not been carefully compared: *Udeopsilla*, 2 sp.; *Dectes*, 2 sp.; *Anabrus*, 1 sp.; *Stenopelmatus*, 1 sp.; *Orchelimum*, 1 sp.; *Xiphidium*, 1 sp.; *Ceuthophilus*, 1 sp.; and a single larva of a Mantid.

LARVA OF CHRYSOMELA CLIVICOLLIS, KIRBY.

BY G. H. FRENCH, CARBONDALE, ILL.

Length .30 of an inch; abdomen nearly globular, flattened beneath; head and thorax narrow. Head pale grayish yellow; thorax and abdomen pale gray, a dorsal blackish line on the abdomen and a transverse stripe of the same on the thorax. Stigmata black, legs pale, the articulations dark; two black spots on each side of the head. Body smooth, shining, a few hairs on the anterior part.

Chrysalis.—Length .40 of an inch; thorax, wing and leg cases rose pink, as also the under side of abdomen; upper side of abdomen pinkish gray with a dorsal pink line. Stigmata black. Each joint of abdomen has a transverse row of black points on its posterior edge.

This larva was found feeding on the leaves of *Ensenia albida*, a vine of the milk-weed family, August 21, 1884. Several times the beetles have been found on a prickly ash bush that grows not far from where this vine has grown in my yard for a number of years, but I could not see that they had eaten the leaves of the bush; but last summer both the larvæ and beetles were found on this vine eating the leaves, establishing the fact of food plant. The larva pupated September 2nd, and the imago appeared September 8th, giving six days as a pupal period.